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Flounders of the Maritimes

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The Canadian Atlantic flounders represent an undeveloped resource of considerable magnitude. The use of more efficient fishing methods and the production of a greater variety of marketable species are essential to the maintenance of Canada's position in export trade and to the development of a domestic market for fish. Increased exploitation of our flounder resources is one method through which our fishing industry can keep pace with the changing times. Flounder landings at major New England ports increased rapidly from less than one million pounds in 1915 to fifty million pounds in 1945 but during the same period Canadian east-coast landings increased much more slowly from less than one million pounds to only five million pounds. The greater development of flounder fishing in the United States is directly related to the increased use of otter trawling as an efficient method of catching groundfish in both offshore and inshore waters.

Flounders are sufficiently abundant on both offshore and inshore fishing grounds to support a much greater production. As a result of the expansion of the offshore otter-trawl fleet, annual landings of offshore flounders have increased to more than three million pounds. This catch is made incidental to cod and haddock fishing. Because of low price, fishermen tend to avoid flounder grounds and land only the largest of the flounders taken. When it is difficult to make large catches of cod and haddock, fishermen land larger flounder catches. About two million pounds of flounders are produced annually from inshore grounds. Here again flounder fishing is for the most part incidental to line fishing for cod and haddock.

The Fisheries Research Board has encouraged the development of the flounder industry by publicizing descriptions and distributions of the different flounder species found in the Maritimes (see footnote) and by attempting to assess the potentialities of inshore flounder resources through exploratory dragging and detailed life-history investigations of the most important species. The present circular incorporates the information contained in previous articles (some of which are out of print) and includes information recently obtained from exploratory operations.

Six Species

There are six different species of flounder commonly taken from Canadian east-coast waters. They differ in appearance, life history, distribution, habitat, abundance and relative value to the industry. Considerable confusion still exists in the identifica-

tion of the flounders landed commercially in the Maritimes. Different common names are used for the same species and the same common name is used for different species. This confusion of species' names and the general failure to recognize differences among flounders with superficially similar appearance have resulted in certain marketing problems and frequently in serious errors in Fishery Statistics.

The six common flounder species may be conveniently divided into three groups: (1) the large-mouth group — **Plaice** and **Brill**, (2) the small-mouth offshore group — **Yellowtail** and **Witch**, and (3) the small-mouth inshore group — **Winter Flounder** and **Smooth Flounder**.

Plaice and Brill

The large-mouth flounders are readily distinguished. The **Plaice** is a large flounder of considerable economic importance and is well known to both inshore and offshore fishermen from the Gaspe to the Bay of Fundy. It is taken by hook and line and by otter trawl from waters generally deeper than 20 fathoms. The **Brill**, on the other hand, is a small warm-water species of little or no commercial importance. It is found on sandy bottom in shoal water throughout the Maritimes and occurs most commonly in the waters of the southern Gulf of St. Lawrence. It is often called the "Window-pane" or "Daylight Flounder" because of its translucency.

Yellowtail and Witch

The small-mouth offshore flounders are well known to otter-trawl fishermen. The **Yellowtail** is abundant on offshore banks from 16 to 35 fathoms. Inshore it occurs from south-western Nova Scotia to Chaleur Bay in relatively small numbers. The greatest inshore concentrations are in Cape Breton and Northumberland Strait waters. These inshore Yellowtails are of small average size and are found in depths less than 20 fathoms. The **Witch** or "Grey Sole" is taken from deeper offshore waters with spring catches of cod and haddock and with redfish catches. It is found in deep inshore waters throughout the Maritimes with greatest concentrations in Chedabucto Bay area.

Smooth Flounder and Winter Flounder

The small-mouth inshore flounders are very similar in appearance but differ in habitat and distribution. The **Smooth Flounder** is sufficiently small and uncommon to be of little commercial significance. It is found in very shoal and brackish or estuarial waters of the Bay of Fundy and Gulf of St. Lawrence. The **Winter Flounder** is a common inshore species found abundantly throughout the Maritimes. Most Winter Flounders are found in

1. "Our Eastern Flat-Fishes" by A. G. Huntsman, in *Canadian Fisherman*, June, 1918.
2. "The Marine Fishes of Nova Scotia" by V.D. Vladykov and R. A. McKenzie, in *Proc. Nova Scotia Inst. of Science*, Vol. XIX 1935
3. "The Eastern Canadian Maritime Flat-Fishes" by R.A. McKenzie, in *Prog. Rept., Atl. Coast Stations*, No. 25, 1939.

PLAICE

(Hippoglossoides platessoides)

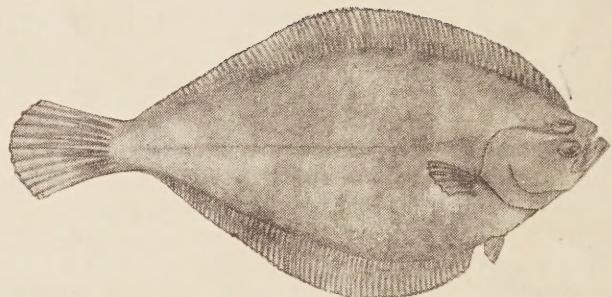
OTHER COMMON NAMES — Dab, Blackback, Flounder, and Sole.

CHARACTERISTICS — Eyes and color on right side. Mouth large. Uniform reddish brown color above. White below. Lateral line almost straight. Rough surface. 65-75 anal rays. 76-96 dorsal rays. Strong pre-anal spine. Body broad and thick.

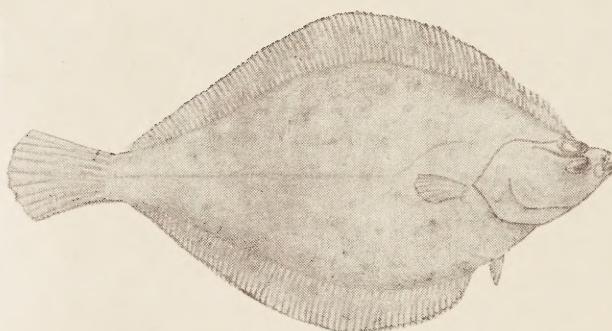
DISTRIBUTION — Whole coast — Arctic to Long Island. Smooth bottom. Sand and mud. 20-70 fathoms.

FISHING — Inshore and offshore. Line trawl and otter trawl. Most important flounder commercially.

SIZE — Landed offshore fish average 20 inches and 2 to 3 pounds but Plaice may reach 30 inches and 7 pounds.



Large Mouth



Small Mouth

YELLOWTAIL

(Limanda ferruginea)

OTHER COMMON NAMES — Rusty Dab, Dab, and Sand Dab.

CHARACTERISTICS — Eyes and color on right side. Mouth small. Olive brown above. Yellow beneath tail. Rusty red spots above. Eyes close together. Lateral line strongly arched. Scales rough. 56-65 anal rays. 75-87 dorsal rays. Strong pre-anal spine. Body broad but thin. Head profile concave dorsally.

DISTRIBUTION — Northern Gulf of St. Lawrence to New Jersey. Sandy bottom. Rarely below 35 fathoms offshore and 20 fathoms inshore.

FISHING — Nova Scotia offshore banks. Otter trawl. Abundant. Important commercially.

SIZE — Offshore catches average 16 inches and 1.5 pounds but may reach 22 inches and 3 pounds.

WINTER FLOUNDER

(Pseudopleuronectes americanus)

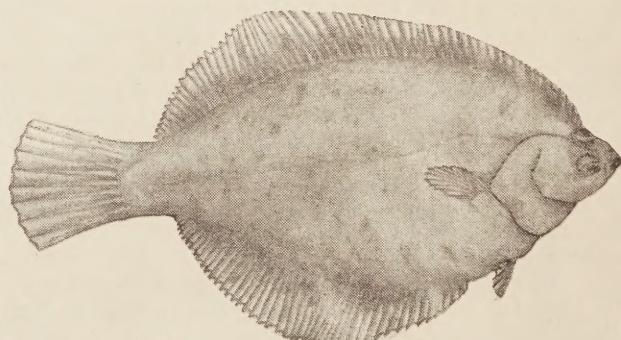
OTHER COMMON NAMES — Flounder, Blackback (in U. S. A.), Lemon Sole (when over 2.5 lbs. offshore).

CHARACTERISTICS — Eyes and color on right side. Mouth small. Dark variable color above (spotted). White below (often lemon tinged). Lateral line slightly arched. Scales rough above. 43-51 anal rays. 61-69 dorsal rays. (Lemon Sole has 49-54 anal, 66-72 dorsal rays). Pre-anal spine. Body thick. Caudal broad.

DISTRIBUTION — Labrador to Georgia. Mud, sand, and clay. Down to 20 fathoms.

FISHING — Inshore. Abundant. Hand line, spear, weir, and drag trawl.

SIZE — Rarely larger than 18 inches and 3 pounds.



East Coast Flounders

I. Peterson

BRILL

(*Lophopsetta aquosa*)

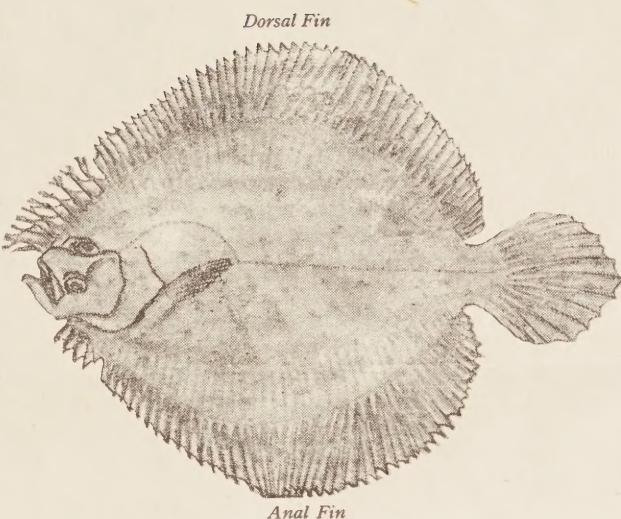
OTHER COMMON NAMES — Windowpane, Sand flounder, and Daylight.

CHARACTERISTICS — Eyes and color on left side. Mouth large. Smooth surface. White below. Grey olive or red to slaty brown above. Mottled with light and dark spots above. Lateral line bowed abreast pectoral fin. 39-52 anal rays. 60-67 dorsal rays. First dorsal rays free and branched. Ventral or pelvic fins with wide base. No pre-anal spine. Body broad and very thin.

DISTRIBUTION — Southern Gulf of St. Lawrence and New England to South Carolina. Sandy bottom. Warm waters. Down to 15 fathoms.

FISHING — Inshore. Of no commercial value.

SIZE — Small — rarely over 10 inches and 1 pound but attains larger size south of Cape Cod.



WITCH

(*Glyptocephalus cynoglossus*)

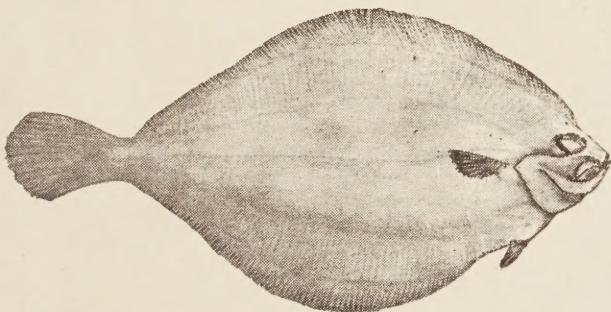
OTHER COMMON NAMES — Grey Sole, and Sole.

CHARACTERISTICS — Eyes and color on right side. Mouth small. Brown to russet grey above. Grey below. Dorsal and anal fins dark fringed. Pectoral dark. Lateral line almost straight. Smooth surface. Body elongate and thin. 79-116 anal ray. 100-115 dorsal rays. Pre-anal spine present. Large open mucous pits on lower surface of head.

DISTRIBUTION — Whole coast — from Newfoundland to Delaware Bay. 15-100 fathoms. Soft bottom — muddy sand, clay.

FISHING — Generally offshore. Otter trawl.

SIZE — Landings average about 18 inches and 1.5 pounds but Witch may reach 25 inches and 4 pounds.



SMOOTH FLOUNDER

(*Liopsetta putnami*)

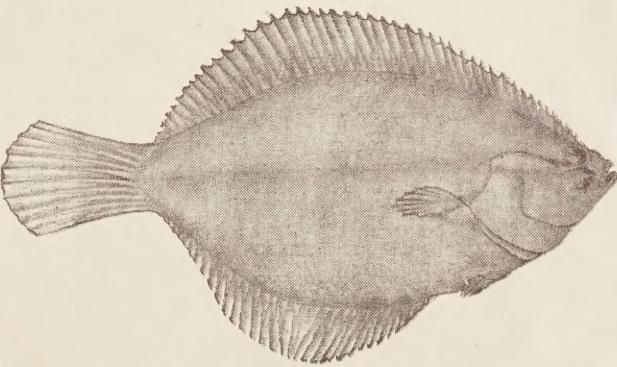
OTHER COMMON NAMES — Smoothback flounder, and Eelback flounder.

CHARACTERISTICS — Eyes and color on right side. Mouth small. Smooth above and between eyes. Uniform dark color above (brown to slate black). Snow white below. Lateral line straight. Body broad and thick. 34-39 anal rays. 48-57 dorsal rays. Bony head ridge.

DISTRIBUTION — Ungava Bay to Providence, R. I. Brackish, estuarial shoal water species. Soft mud bottom. Down to 10 fathoms.

FISHING — Inshore. Of little commercial importance. Hand line, spear, drag trawl, and weir.

SIZE — Small — to 12 inches and 1.5 pounds.



waters shoaler than ten fathoms. They are taken in greatest numbers during spring months when large spawning fish may be readily caught close to shore. This species is marketed in the United States as "Blackbacks" when small and as "Lemon Soles" when large. In Canada large numbers are used as lobster bait and fox food as well as for human consumption.

Offshore and Inshore Groups

The common offshore flounders are Plaice and Yellowtail. Almost all flounders taken by off-shore line-trawl fishermen are Plaice but otter trawlers take Yellowtail, Plaice, and less commonly Witch. The occasional "Lemon Sole" (large Winter Flounder) is also landed.

The common inshore species is the Winter Flounder. Smooth Flounders and Brill occur in inshore waters but they are not commercially important. Yellowtails occur inshore in relatively small numbers. The deep water inshore species are Plaice and Witch. To date Plaice and Winter Flounders are the only species of commercial importance to the inshore fisherman.

Exploratory Dragging

During 1947 and 1948 the Fisheries Research Board conducted exploratory dragging in inshore waters from Annapolis Basin to Cape Breton, N. S., and Murray Harbour, P. E. I., to Chaleur Bay, N. B. All six flounder species were taken but only two of these, the Winter Flounder and Plaice, were sufficiently large and abundant to indicate major commercial possibilities.

Yellowtails were taken most commonly from the waters of Cape Breton and the southern Gulf of St. Lawrence. Brill were found in much the same environment. They were taken from shoal water throughout the Maritimes and were most abundant in the southern Gulf of St. Lawrence. Both species were found most commonly in waters which attain a high summer temperature. Smooth Flounders were taken in small numbers from the shoal water of Shippegan and Richibucto Harbours. All three species were found to be of small average size and only in a Liverpool sample of Yellowtails did an appreciable number exceeding twelve inches in total length occur.

The Plaice and Witch constitute a contrast to those mentioned above in that they were most commonly taken from waters deeper than twenty-five fathoms and only rarely were they found in the Northumberland Strait area. Witch were not common but all those taken were of large average size. Large numbers of Witch, fifteen to twenty-five inches in length, were taken from Chedabucto Bay, N. S. Plaice were found to be abundant throughout the Maritimes. The smallest Plaice were concentrated in deep water (35-45 fathoms) but larger fish were abundant in somewhat shoaler waters. Plaice exceeding twelve inches in length were taken in significant quantities from St. Margaret's Bay, Country Harbour, Chedabucto Bay, N. S., and Chaleur Bay, N. B. Although Plaice will probably continue to be taken in greatest quantities as a by-product of cod and haddock fishing, large numbers may be readily taken by inshore draggers.

The Winter Flounder is considered separately since it was found in almost all of our shoal-water drags throughout the Maritimes. It was found in less than ten fathoms for the most part with very few

deeper than twenty fathoms in any area. The smallest fish were concentrated in very shoal water and most of those taken from waters deeper than ten fathoms were large in size. During spring months the large mature flounders concentrate in shoal waters and spawn. It is at this season that the greatest numbers are taken by spear, hook and line, and weir. Although abundant along the whole Canadian east coast, Winter Flounders were of large average size in only a small proportion of the exploratory drags. Only in Annapolis Basin, St. Mary's Bay, Country Harbour, N. S., and Murray Harbour, P. E. I., were forty percent of the flounders taken more than twelve inches in length. In other areas such as Argyle, Pubnico, Shelburne Harbour and St. Margarets Bay the average size appeared to be too small to make dragging practical but flounders were of sufficiently large size for commercial quantities of large fish to be taken by selective fishing methods such as spear and hand line.

Recent Developments

During recent years the winter flounder has increased in importance as lobster bait and in the Argyle-Pubnico area alone more than 100,000 lbs. are taken for this purpose. A similar quantity has been taken during recent months by two small draggers from Annapolis Basin and St. Mary's Bay for marketing as "Blackback" fillets. It is apparent from operations already carried out that flounder dragging in these areas is a profitable fishing method. These recent developments are indicative of the potentialities of further exploiting our inshore flounder resources.

Fishing Gear

The fishing gear generally used to date for the flounder fishery (hook and line, spear and weir) has selected the larger fish. This equipment has been of low cost and has proven efficient in spring and early summer months. Such methods are adequate for most inshore fishermen. The low cost and selective nature of the gear enable both young and old to participate in this shore fishery. The potentialities of otter trawling with small boats are limited by the relatively high cost of fishing equipment and the unselective nature of the gear. The possibility of a restricted dragging development is nevertheless apparent.

Potential Expansion

To date our flounder resources have been poorly exploited. The greater demand and price for other groundfish species such as cod and haddock have restricted the expansion of this fishery. The flounders landed commercially in the Maritimes are for the most part over fifteen inches in total length but only a very small percentage of our flounders attain such a size. In the New England states flounders as small as ten to twelve inches in total length are marketable. The development of a large flounder industry in Canada hinges on a decrease in the size acceptable to Canadian markets to a level comparable with that now used in the United States. The existence of large quantities of medium-sized flounders has now been demonstrated and the development of an inshore flounder industry has been initiated.

Further development of the flounder industry is limited by the expansion of the potential market for medium-sized fish rather than by any limitation in the number of fish available.